

Utah Hazardous Substances Emergency Events Surveillance

**Cumulative Report
2004**



**Utah Department of Health
Office of Epidemiology
Hazardous Substances Emergency Events Surveillance (HSEES)**



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EXECUTIVE SUMMARY

The Hazardous Substances Emergency Events Surveillance (HSEES) system, maintained by the Agency for Toxic Substances and Disease Registry (ATSDR), actively collects information to describe the public health consequences of acute releases of hazardous substances in participating states. This report summarizes the characteristics of events reported to [state] in 2004. Information about acute events involving hazardous substances was collected, including the substance(s) released, number of victims, number and types of injuries, and number of evacuations. The data were computerized using an ATSDR-provided Web-based data entry system.

A total of 504 events were reported. In 285 (56.5 %) events, only one substance was released. The most commonly reported categories of substances were other inorganic substances, volatile organic compounds and oxy-organics. During this reporting period, 38 events (7.5 % of all reported events) resulted in a total of 93 victims, of whom 0 (0.0 %) died. The most frequently reported injuries were respiratory irritation, dizziness/central nervous system symptoms and headache. Evacuations were ordered for 12 (2.4 %) events.

The findings regarding the percentage of events with victims had been decreasing but increased during 2004. The distribution of the types of injuries reported showed a decrease in gastrointestinal symptoms but an increase in dizziness/central nervous system symptoms. Respiratory irritation and headaches continued to stay in the top as type of injuries most frequently occurring. Prevention outreach efforts for 2004 focused on outreach for college apartment complexes and carbon monoxide poisoning, outreach for swimming pools and education regarding chlorine releases, and providing a fact sheet regarding mixing cleaning products for adult care and child day care facilities.

INTRODUCTION

The Centers for Disease Control and Prevention defines surveillance as the

“ongoing, systematic collection, analysis, and interpretation of health data essential to the planning, implementation, and evaluation of public health practice, closely integrated with the timely dissemination of these data to those who need to know. The final link of the surveillance chain is the application of these data to prevention and control. A surveillance system includes a functional capacity for data collection, analysis, and dissemination linked to public health programs”[1].

Since 1990, the Agency for Toxic Substances and Disease Registry (ATSDR) has maintained an active, state-based Hazardous Substances Emergency Events Surveillance (HSEES) system to describe the public health consequences of releases of hazardous substances. The decision to initiate a surveillance system of this type was based on a study published in 1989 about the reporting of hazardous substances releases to three national databases: the National Response Center Database, the Hazardous Material Information System (HMIS), and the Acute Hazardous Events Database [2].

A review of these databases indicated limitations. Many events were missed because of specific reporting requirements (for example, the HMIS did not record events involving intrastate carriers or fixed-facility events). Other important information was not recorded, such as the demographic characteristics of victims, the types of injuries sustained, and the number of persons evacuated. As a result of this review, ATSDR implemented the HSEES system to more fully describe the public health consequences of releases of hazardous substances.

HSEES has several goals:

- To describe the distribution and characteristics of acute hazardous substances releases;
- To describe morbidity and mortality among employees, responders, and the general public that resulted from hazardous substances releases; and
- To develop strategies that might reduce future morbidity and mortality resulting from the release of hazardous substances.

For a surveillance system to be useful, it must not only be a repository for data, but the data must also be used to protect public health.

In the last few years, the last goal of the HSEES system has been emphasized; i.e., to develop strategies to reduce subsequent morbidity and mortality by having each participating state analyze its data and develop appropriate prevention outreach activities. These activities are intended to provide industry, responders, and the general public with information that can help prevent chemical releases and reduce morbidity and mortality if a release occurs.

This report provides an overview of HSEES for 2004 in Utah, summarizes the characteristics of acute releases of hazardous substances and their associated public health consequences, and demonstrates how data from the system are translated into prevention activities to protect public health.

METHODS

In 2004, thirteen state health departments participated in HSEES: Colorado, Iowa, Louisiana, Minnesota, Missouri, New Jersey, New York, North Carolina, Oregon, Texas, Utah, Washington, and Wisconsin.

Beginning in 2002, a newly updated data-collection form, approved by the Office of Management and Budget, went into effect. Information was collected about each event, including substance(s) released, victims, injuries (adverse health effects and symptoms), and evacuations.

Various data sources were used to obtain information about these events. These sources included, but were not limited to, Utah Division of Environmental Response & Remediation, Utah Highway Patrol, National Response Center, Utah Poison Control, Department of Transportation Hazardous Materials Information System, Lexis Nexis (media alert system), media (newspaper, radio, television), local health agencies and industry. Census data were used to estimate the number of residents in the vicinity of most of the events. All data were computerized using a Web-based data entry system provided by ATSDR.

HSEES defines hazardous substances emergency events as acute uncontrolled or illegal releases or threatened releases of hazardous substances. Events involving releases of only petroleum are excluded. Events are included if (a) the amount of substance released (or that might have been released) needed (or would have needed) to be removed, cleaned up, or neutralized according to federal, state, or local law or (b) the release of a substance was threatened, but the threat led to an action (for example, evacuation) that could have affected the health of employees, emergency

responders, or members of the general public. HSEES defines victims as people who experience at least one documented adverse health effect within 24 hours after the event or who die as a consequence of the event. Victims who receive more than one type of injury or symptom are counted once in each applicable injury type or symptom. Events are defined as transportation-related if they occur (a) during surface, air, pipeline, or water transport of hazardous substances, or (b) before being unloaded from a vehicle or vessel. All other events are considered fixed-facility events.

For data analyses, the substances released were categorized into 16 groups. The category “mixture” comprises substances from different categories that were mixed or formed from a reaction before the event; the category “other inorganic substances” comprises all inorganic substances except acids, bases, ammonia, and chlorine; and the category “other” comprises substances that could not be grouped into one of the other existing categories.

RESULTS

For 2004, a total of 504 acute hazardous substances events were captured by Utah HSEES: Three (0.6%) of these events were threatened releases. There were no events in which substances were both threatened to be released and actually released. A total of 397 (78.8%) events occurred in fixed facilities. The counties with the most frequent number of events were San Juan (208 [41.3%]) and Salt Lake County (145 [28.8%]) (Table 1).

For each fixed-facility event, one or two types of area or equipment involved in the fixed facility where the event occurred could be selected. Of all 397 fixed-facility events, 394 (99.2%)

reported one type of area and three (0.8%) reported a combination of two area types. Type of area was not reported for zero (0.0%) events. Among events with one type of area reported, the main areas were classified as follows: 278 (70.0%) ancillary process equipment, 31 (7.6%) indoor, non-industrial, living (residence) areas, 30 (7.6%) indoor, non-industrial, non-living areas (Figure 1). Of the events with two areas, there were three that were involved in combination with other type of areas. They were: 1 (33.0%) involved piping and storage area above ground, 1 (33.0%) involved outdoor, farming or industrial areas, and indoor, non-industrial, non-living areas, and 1 (33.0%) involved outdoor farming and outdoor non-farming.

Of the 107 transportation-related events, 93 (86.9%) occurred during ground transport (e.g., truck, van, or tractor) and 11 (10.3%) involved transport by rail (Figure 2). Fewer events involved water, air, and pipeline transportation modes. Most (81.3%) ground transportation events involved trucks. The largest proportions of transportation-related events occurred during a release en route that was later discovered at a fixed facility (59 [55.1%]) and from unloading of a stationary vehicle or vessel (26 [24.3 %]). Of the 107 transportation-related events, 22 (20.6 %) involved a moving vehicle or vessel.

Factors contributing to the events consisted of primary and secondary entries. Primary factors were reported for 504 (100.0%) events (Figure 3a). Of the reported primary factors, most (80.6%) fixed-facility events involved equipment failure, and most (69.2%) transportation-related events also involved equipment failure. Secondary factors were reported for 268 (53.2%) events (Figure 3b). Of the reported secondary factors, most (29.4%) fixed-facility events involved system process upset, and most (81.3%) transportation-related events involved improper filling, loading or packing.

More than 56.5% of all events involved the release of only one substance. Two substances were released in approximately 2.2% of the events, and approximately 41.3 % involved the release of more than two substances (Table 2). Fixed-facility events were more likely than transportation events to have two or more substances released in an event (54.4 % vs. 2.8 %).

The number of events by month ranged from 30 (6.0%) in April to 71 (14.1%) in July, with the largest proportions occurring from May through August. The proportion of events ranged from 14.3% to 17.7% during weekdays, and from 9.5% to 11.5% during weekend days. Of all 504 (100.0%) events for which time of day or time category was reported, 42.9% occurred from 6:00 AM to 11:59 AM, 29.2% from 12:00 PM to 5:59 PM, 13.5% from 6:00 PM to 11:59 PM, and the remainder during the early hours of the day.

Industries

The largest proportions of HSEES events were associated with the wholesale trade (205 [40.7%]) and transportation (105 [20.8%]) industries (Table 3). The largest number of events with victims occurred from the personal services industry (9 [23.7%]). The total number of victims was greatest in the professional services industry (23 [24.7%]) followed by the number of victims in personal services (19 [20.4%]) and retail trade (13 [14.0%]). Although the personal services industry resulted in a large proportion of events with victims and a large number of victims, only 31.0% of all 29 events resulted in victims. Conversely, 100.0% of all events in the public administration industry resulted in victims, but this industry represents a small proportion (7.9%) of events with victims.

Substances

A total of 1138 substances were released or were threatened to be released in all events, of which 4 (0.4%) substances were reported as threatened to be released. The individual substances most frequently released were sulfur dioxide, carbon monoxide, volatile organic compounds and nitrogen oxide (NOX) (Appendix). Substances were grouped into 16 categories. The substance categories most commonly released in fixed-facility events were other inorganic substances (474 [46.1%]), oxy-organics (227 [22.1%]), and volatile organic compounds (219 [21.3%]) (Table 4). In transportation-related events, the most common substance categories released were acids (21 [19.1%]), volatile organic compounds (20 [18.2%]), and bases (13 [11.8%]).

Two types of releases for each substance (e.g., spill and air) could be reported. Only one type of release was associated with the following: air releases (945 [83.0%]), spills (169 [14.9%]), threatened release (4 [0.4%]), fire (0 [0.0%]), explosion (0 [0.0%]), and radiation (0 [0.0%]). Of events with two types of releases, the following combinations were reported: air releases and spills (20 [1.8%]). The release type was missing for 0 substances.

Victims

A total of 93 victims were involved in 38 events (7.5% of all events) (Table 5). Of the 38 events with victims, 19 (50.0%) events involved only one victim, and 7 (18.4%) involved two victims. Of all victims, 89 (95.7%) were injured in fixed-facility events. Fixed-facility events were more likely to have three or more victims per event (14.3%) than were transportation-related events (0.0%).

To represent the magnitude of the effects of substances involved in injuries, the number of events in a specific substance category was compared with the number of events in the same category that resulted in victims. In events that involved one or more substances from the same substance category, substances were counted once in that category. In events that involved two or more substances from different categories, substances were counted once in the multiple substance category. Substances released most often were not necessarily the most likely to result in victims (Table 6). For example, events categorized as multiple substance category constituted 42.7% of all events; however, only 0.5% of these events resulted in injuries. Conversely, events involving pesticides and oxy-organics accounted for 2.4% and 5.6% of all events respectively, but 25.0% of the pesticide events and 50.0% of oxy-organics events resulted in injuries.

Employees (61 [65.6%]) constituted the largest proportion of the population groups injured, followed by the general public (28 [30.1 %]) (Figure 4). In fixed-facility events, no emergency response personnel were injured. There were no responders injured during transportation-related events.

Victims were reported to sustain a total of 153 injuries or symptoms (Table 7). Some victims had more than one injury or symptom. Of all reported injuries/symptoms, the most common injuries/symptoms in fixed-facility events were respiratory irritation (41 [27.9%]), dizziness/central nervous system symptoms (30 [20.4%]), and headache (26 [17.7%]). In transportation-related events, dizziness/central nervous system symptoms (2 [33.3%]), gastrointestinal system problems (2 [33.3%]), headache, (1 [16.7%]), and heart problems (1 [16.7%]) were reported most frequently.

The median age of the 72 (77.4%) victims for whom exact age was reported was 26 years (range: 1-58 years). For the 16 (17.2%) injured persons for whom an age category was reported, 0 (0.0%) were < 5 years of age, 0 (0.0%) were 5–14 years of age, 1 (6.3%) were 15–19 years of age, 14 (87.5%) were 20–44 years of age, 0 (0.0%) were 45–64 years of age, and 1 (6.3%) were ≥65 years of age. Of the 5 injured persons for whom age was not reported, all 5 (100.0%) could have been adults or children (because their population group was reported as members of the general public).

Sex was known for 91 (97.9%) of the victims; of these, 54 (58.1%) were males. Of all employees and responders for whom sex was reported, 60.0% were males.

Of the 93 victims, 69 (74.2%) were treated at a hospital (not-admitted) and 16 (17.2%) were treated on scene (first-aid). No deaths were reported (Figure 6). Severity was unknown for 0 (0.0%) victims.

The status of personal protective equipment (PPE) use was reported for 61 (100.0%) employee-victims. All of the employee-victims (0.0%) had not worn any form of PPE.

The event that consisted of the largest amount of victims was the result of an x-ray machine backing up. The machine contained Spectra developer replenisher and Spectra fixer and replenisher. The product spilled on the floor and walls, soaking the dry wall. The carpet was cleaned by a professional cleaning service. But, there was still a strong odor in the air. The twelve employees involved were all having symptoms.

These symptoms included lightheadedness, headache, nausea and eye-irritation. They evacuated the area, until it could be aired out.

Nearby populations

The proximity of the event location in relation to selected populations was determined using geographic information systems (GIS) or health department records. Residences were within ¼ mile of 359 (71.2%) events, schools within ¼ mile of 25 (5.0%) events, hospitals within ¼ mile of 2 (0.4%) events, nursing homes within ¼ mile of 3 (0.6%) events, licensed daycares within ¼ mile of 9 (1.8%) events, industries or other businesses within ¼ mile of 286 (56.8%) events and recreational areas within ¼ mile of 26 (5.2%) events. Information for proximity of the event location in relation to selected populations was missing for 0 events.

The number of events at which persons were at risk of exposure was determined primarily using GIS. There were 381 (75.6%) events with persons living within ¼ mile of the event; 428 (84.9%) events with persons living within ½ mile; and 451 (89.5%) events with persons living within 1 mile. Information on the number of people living within ¼, ½, and 1 mile of the event was missing for 25 events.

Evacuations

Evacuations were ordered in 12 (2.4%) of 504 events where evacuation status was reported. Of these evacuations, 58.3% were of buildings or affected parts of buildings; 41.7% were of defined circular areas surrounding the event locations; 0.0% were of areas downwind or downstream of

the event; and the remainder were of circular and downwind or downstream areas, of no criteria, or not known.

The number of people evacuated was known for 11 (91.7%) events and ranged from 5 to 100 people, with a median of 42.5 people.

The median length of evacuation was 4.3 hours (range: 1 to 12). Evacuation length was missing for 0 (0.0%) events. Of all 504 events, 26 (5.2%) had access to the area restricted. There were no events that had in-place sheltering ordered by an official.

Decontamination

Of the 93 (100.0%) victims for whom decontamination status was known, 87 (93.5%) were not decontaminated, 6 (6.5%) were decontaminated at the scene, 0 (0.0%) were decontaminated at a medical facility, and 0 (0.0%) were decontaminated at both the scene and a medical facility.

In events where uninjured persons were decontaminated, the median number of uninjured decontaminated individuals was 2 persons per event (range: 1-2 persons). Decontamination at a medical facility was done for 0 uninjured employees, 0 uninjured responders, 0 uninjured members of the general public, and 0 uninjured students. Decontamination at the scene was done for 2 uninjured employees, 0 uninjured responders, 0 uninjured members of the general public, and 0 uninjured students.

Response

Of the 445 (88.3%) events with information on who responded to the event, 8.3% reported 2 or more categories of personnel who responded, 2.5% reported 3 or more categories, and 0.7% reported 4 or more categories. The response team of company where release occurred 403 (90.6%) responded most frequently to events, followed by certified HazMat 35 (7.9%), fire department 25 (5.6%), and law enforcement agency 15 (3.4%) (Table 8).

2004 Prevention Outreach Activities

The first outreach activity was focused on creating a fact sheet to increase awareness amongst the general public in Utah to inform them of the hazards of mixing chlorine-based household products with other household cleaning products. The outreach on the hazards of bleach and or mixing bleach with other household cleaners, includes: a fact sheet on the hazards of mixing bleach with other products, a downloadable flyer (poster), case histories from the HSEES database, links to relevant web pages, and a description of the HSEES project. In addition, the fact sheet was piloted by distributing educational materials to 20-childcare or adult care facilities. The goal was to decrease the amount of HSEES events and the amount of injuries that are caused by mixing chlorine-based household products with other household cleaning products.

The second outreach activity was doing prevention targeting large dormitories or college apartment complexes of the dangers of carbon monoxide injury and/or death. In the state of Utah in the year 2002, 1200 students were evacuated and 29 students were seen at the hospital from a release of carbon monoxide. A pamphlet about carbon monoxide poisoning danger and the signs and symptoms of carbon monoxide was created.

It was then distributed to maintenance and management of college dormitories and apartment complexes. They were asked to post the pamphlet in an area where students would have access to read it, such as in the office; some distributed it directly to the student's apartments.

The third outreach activity was doing outreach by phone-for swimming pool chemicals. Phone-outreach was performed by directly contacting swimming pool managers, owner/operators, public works directors, parks and recreation directors and others to inform them that, according to HSEES data, for every 3 chlorine releases (1993-1999), one or more of them generated victims, evacuees, or both. Those contacted received information regarding the scope of the Utah HSEES program. The phone survey includes questions on the maintenance of their facilities and if they have any kind of emergency plan.

The HSEES coordinator implemented an activity to prevent the incidence of carbon monoxide injury and/or death related to large dormitories or college apartment complexes. In the state of Utah in the year 2002, 1200 students were evacuated and 29 students were seen at the hospital from a release of carbon monoxide. A pamphlet about carbon monoxide poisoning danger and the signs and symptoms of carbon monoxide was created; it included a description of the HSEES program, case histories from the HSEES database, and links to relevant website's. The pamphlet was then approved and distributed to maintenance and management individuals over college dormitories and college apartment complexes. There were 500 pamphlets distributed to seven universities and colleges' dormitories and apartment complexes throughout the state of Utah. They were asked to post the pamphlet in an area where students may read it, or distribute to their students. Feedback showed that the majority of the dormitories or apartments posted the pamphlet in stairwells and areas where students read updates, and information on upcoming events.

Several apartments and two dormitories wanted several pamphlets to leave in an area for interested students to take as wanted. They have said that several have been taken. One college dormitory thought it was such a positive outreach activity and was very important information that she had me contact the maintenance director of the college campus. When I discussed it with her she agreed it was a beneficial activity, and requested 15 pamphlets to distribute to the various buildings, for employees to read. It is difficult to determine how many students actually read the pamphlet, front to back, but it was distributed to areas that would have traffic of over several thousand students walking through.

At one college dormitory at least 30 were distributed to each individual dorm room or cottage style apartment.

SUMMARY OF RESULTS, 2000–2004

During 2000–2004, the largest proportion of events occurred in fixed facilities (Table 9). The number of transportation related-events has decreased in recent years. This could be due to excluding events that don't meet the reporting rule of either 1 gallon or 10 pounds being released. Although the number of total events has been increasing, and this could be due to increased reporting from agencies.

The number of substances released has also increased. The number of events with victims has increased over the last years. This leads to the percentage of events with victims being highest in 2004 (7.5 %) and lowest in years 2002 and 2003 both at (1.8 %). The average percentage of events with victims during 2000–2004 was 3.5 %.

Respiratory irritation has consistently been the most frequently reported injury.

Employees continue to be the most commonly reported victims of acute chemical releases.

However, members of the general public constitute a large proportion of the victims as well (Figure 7). The number of injured responders decreased significantly from the previous years, this decrease is possibly due to increased awareness of the dangers and they are taking more precautions.

The number of deaths associated with acute hazardous substances events has continued to stay at zero. This may be due to not being aware of all events, and thus not capturing those involving deaths.

REFERENCES

1. Centers for Disease Control and Prevention. Comprehensive plan for epidemiologic surveillance. Atlanta: US Department of Health and Human Services; 1986.
2. Binder S. Death, injuries, and evacuations from acute hazardous materials releases. *Am J Public Health* 1989; 70:1042–4.

APPENDIX

The 10 substances most frequently involved in events—Utah Hazardous Substances Emergency Events Surveillance, 2004

Number	Standardized Substance Name	Frequency
1.	Sulfur Dioxide	236
2.	Carbon Monoxide	226
3.	Volatile Organic Compounds	205
4.	Nitrogen Oxide (NOX)	137
5.	Nitrous Oxide	40
6.	Nitrogen Tetroxide	25
7.	Chlorine	20
8.	Sulfuric Acid	11
9.	Hydrochloric Acid	9
10.	Mercury	9
Total		918

Table 1. —Number of events meeting the surveillance definition, by county and type of event – Utah Hazardous Substances Emergency Events Surveillance, 2004

County	Type of event				All events
	Fixed facility		Transportation		
	No. events	%*	No. events	%*	Total no. events (%)
Beaver	0	0.0	0	0.0	0 (0.0)
Box Elder	0	0.0	0	0.0	0 (0.0)
Cache	3	100.0	0	0.0	3 (0.6)
Carbon	2	100.0	0	0.0	2 (0.4)
Daggett	0	0.0	0	0.0	0 (0.0)
Davis	42	75.0	14	25.0	56 (11.1)
Duchesne	0	0	0	0	0 (0.0)
Emery	6	86.0	1	14.3	7 (1.4)
Garfield	1	100.0	0	0.0	1 (0.2)
Grand	3	100.0	0	0.0	3 (0.6)
Iron	1	50.0	1	50.0	2 (0.4)
Juab	0	0.0	0	0.0	0 (0.0)
Kane	0	0.0	1	100.0	1 (0.2)
Millard	9	100.0	0	0.0	9 (1.8)
Morgan	0	0.0	0	0.0	0 (0.0)
Piute	0	0.0	0	0.0	0 (0.0)
Rich	0	0.0	0	0.0	0 (0.0)
Salt Lake	69	47.6	76	52.4	145 (28.8)
San Juan	208	100.0	0	0.0	208 (41.3)
San Pete	2	100.0	0	0.0	2 (0.4)
Sevier	0	0.0	0	0.0	0 (0.0)
Summitt	5	83.0	1	17.0	6 (1.2)
Tooele	16	84.2	3	15.8	19 (3.8)
Uintah	0	0.0	0	0.0	0 (0.0)
Utah	23	95.8	1	4.2	24 (4.8)
Wasatch	0	0.0	0	0.0	0 (0.0)
Washington	2	66.0	1	33.3	3 (0.6)
Wayne	0	0.0	0	0.0	0 (0.0)
Weber	5	41.7	7	58.3	12 (2.4)
Unknown	0	0.0	1	100.0	1 (0.2)
	397		107		504 (100.0 %)

* Percentage = (number of events by type of event per county ÷ total number of events in that county) x 100

Figure 1. —Area of fixed facilities involved in events, Utah Hazardous Substances Emergency Events Surveillance, 2004.

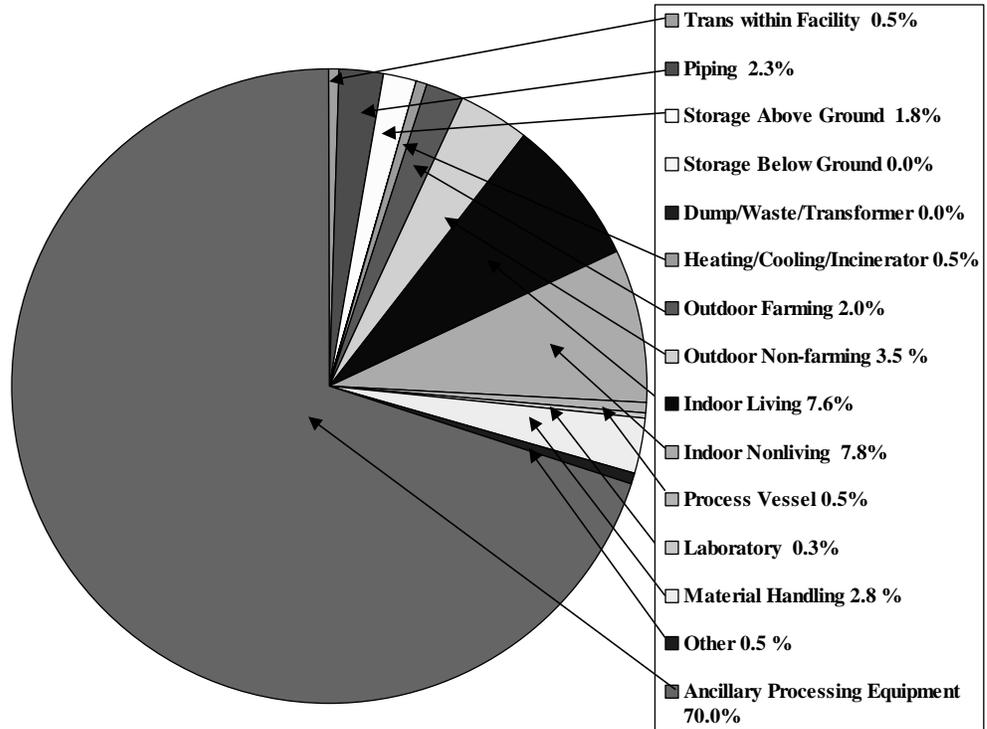


Figure 2. —Distribution of transportation-related events, by type of transport, Utah Hazardous Substances Emergency Events Surveillance, 2004.

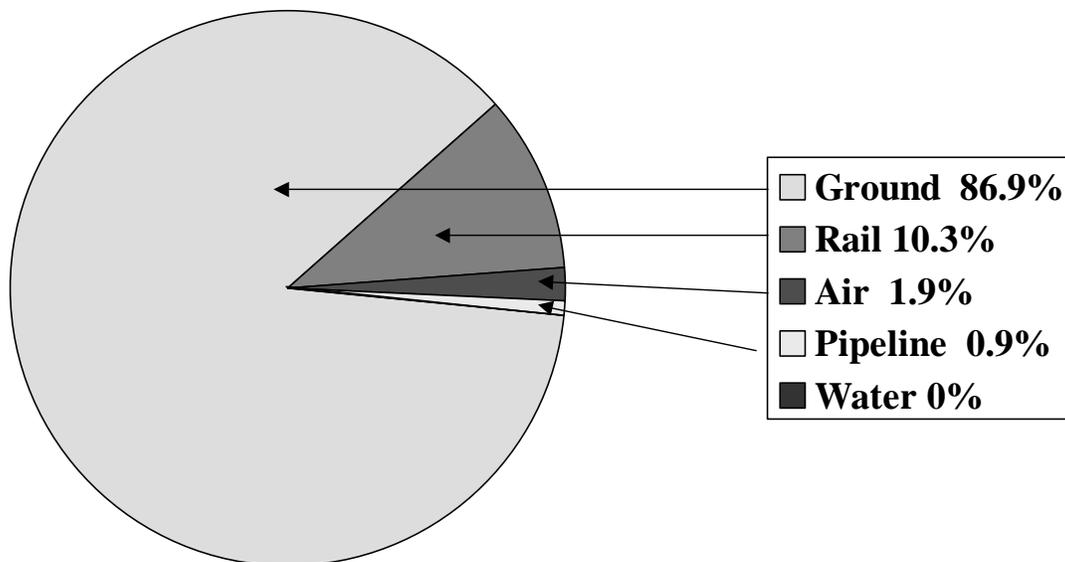


Figure 3a. —Primary factors reported as contributing to events, Utah Hazardous Substances Emergency Events Surveillance, 2004

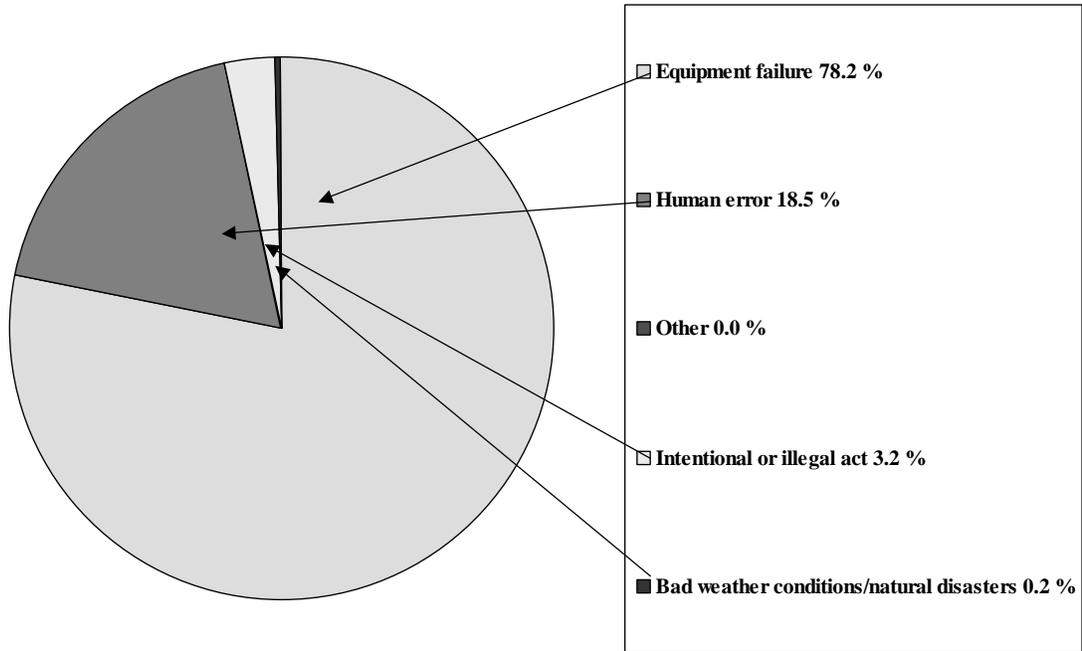


Figure 3b. Secondary factors reported as contributing to events, Utah Hazardous Substances Emergency Events Surveillance, 2004.

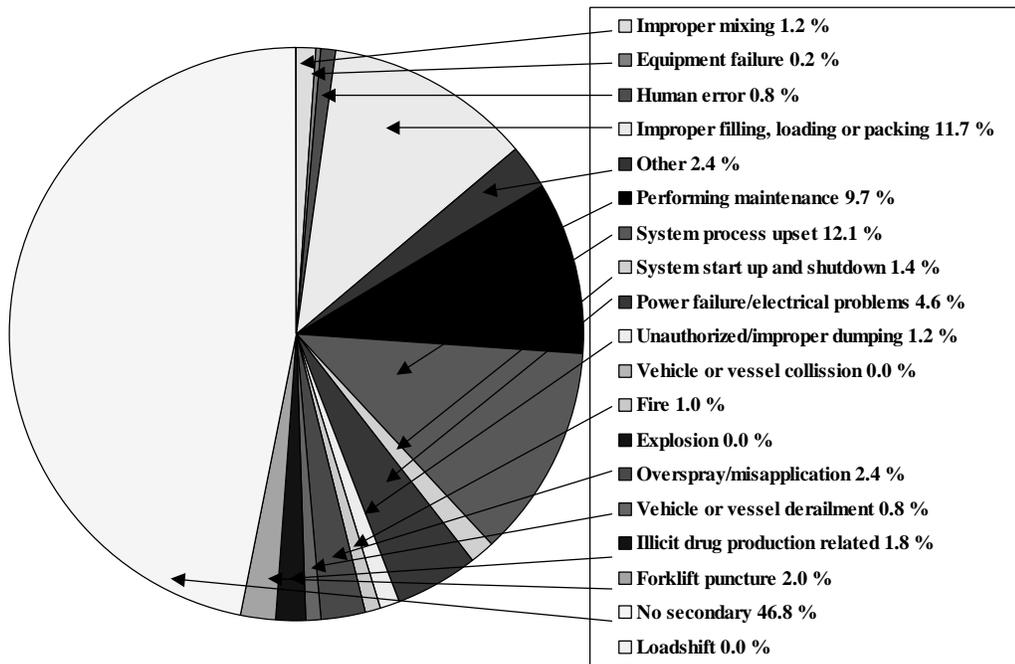


Table 2. – Number of substances involved per event, by type of event –Utah Hazardous Substances Emergency Events Surveillance, 2004

No. substances	Type of event						All events		
	Fixed facility			Transportation					
	No. events	%	Total substances	No. events	%	Total substances	No. events	%	Total substances
1	181	45.6	181	104	97.2	104	285	56.5	285
2	8	2.0	16	3	2.8	6	11	2.2	22
3	1	0.3	3	0	0.0	0	1	0.2	3
4	207	52.1	828	0	0.0	0	207	41.1	828
≥ 5	0	0.0	0	0	0.0	0	0	0.0	0
Total	397	100 %	1028	107	100 %	110	504	100 %	1138

Table 3. – Industries involved in hazardous substance events, by category-Utah Hazardous Substances Emergency Events Surveillance, 2004

Industry category	Total events		Events with victims		Percentage of events with victims	Total no. victims Number (maximum)*
	No.	%	No.	%		
Abandoned [†]	5	1.0	0	0.0	0.0	0
Agriculture	1	0.2	0	0.0	0.0	0
Business and repair services	3	0.6	2	5.3	66.7	4 (1-3)
Communication	0	0.0	0	0.0	0.0	0
Construction	3	0.6	1	2.6	33.3	1 (1)
Entertainment	1	0.2	1	2.6	100.0	2 (2)
Finance and Real estate	1	0.2	1	2.6	100.0	2 (2)
Illegal activity (illicit drug related)	8	1.6	1	2.6	12.5	3 (3)
Illegal activity (non-illicit drug related)	0	0.0	0	0.0	0.0	0
Manufacturing	72	14.3	0	0.0	0.0	0
Mining	12	2.4	0	0.0	0.0	0
Personal services	29	5.8	9	23.7	31.0	19 (1-5)
Private vehicle or property	9	1.8	3	7.9	33.3	4 (1-2)
Professional services	8	1.6	4	10.5	50.0	23 (1-12)
Public administration	3	0.6	3	7.9	100.0	12 (1-9)
Retail trade	9	1.8	6	15.8	66.7	13 (1-5)
Transportation	105	20.8	1	2.6	1.0	1 (1)
Utilities	19	3.8	0	0.0	0.0	0
Wholesale trade	205	40.7	0	0.0	0.0	0
Unspecified and unknown	11	2.2	6	15.8	54.5	9 (1-3)
Total[‡]	504		38		7.5	93

*Minimum number of victims per event =1.

[†]Includes chemical dumped on highway or other property and currently non-operating former businesses.

Percentages do not total 100% because of rounding.

Table 4. –Number of substances involved, by substance category and type of event –Utah Hazardous Substances Emergency Events Surveillance, 2004

Substance category	Type of event				All events	
	Fixed facility		Transportation			
	No. substances	%	No. substances	%	No. substances	%
Acids	20	2.0	21	19.1	41	3.6
Ammonia	4	0.4	1	0.9	5	0.4
Bases	4	0.4	13	11.8	17	1.5
Chlorine	20	2.0	2	1.8	22	1.9
Formulations	0	0.0	0	0.0	0	0.0
Hetero-organics	3	0.3	3	2.7	6	0.5
Hydrocarbons	5	0.5	1	0.9	6	0.5
Mixture*	15	1.5	2	1.8	17	1.5
Other [†]	23	2.2	10	9.1	33	2.9
Other inorganic substances [‡]	474	46.1	9	8.2	483	42.4
Oxy-organics	227	22.1	8	7.3	235	20.7
Paints and dyes	1	0.1	7	6.4	8	0.7
Pesticides	7	0.7	7	6.4	14	1.2
Polychlorinated biphenyls	3	0.3	0	0.0	3	0.3
Polymers	3	0.3	6	5.5	9	0.8
Volatile organic compounds	219	21.3	20	18.2	239	21.0
Total[¶]	1028	(100.2)	110	(100.1)	1138	(99.9)

* Substances from different categories that were mixed or formed from a reaction before the event.

[†] Not belonging to one of the existing categories.

[‡] All inorganic substances except for acids, bases, ammonia, and chlorine.

[¶] Of a total of 1138 substances, 0 were excluded because they were not assigned a substance category: 0 occurred in fixed facilities and 0 during transportation. Percentages do not total 100% because of rounding.

Table 5. –Number of victims per event, by type of event –Utah Hazardous Substances Emergency Events Surveillance, 2004

No. victims	Type of event						All events		
	Fixed facility			Transportation					
	No. events	%	Total victims	No. events	%	Total victims	No. events	%	Total victims
1	17	48.6	17	2	66.7	2	19	50.0	19
2	6	17.1	12	1	33.3	2	7	18.4	14
3	5	14.3	15	0	0.0	0	5	13.2	15
4	2	5.7	8	0	0.0	0	2	5.3	8
5	2	5.7	10	0	0.0	0	2	5.3	10
≥6	3	8.6	27	0	0.0	0	3	7.8	27
Total	35	100	89	3	100	4	38	100	93

Figure 4. —Distribution of victims by population group, Utah Hazardous Substances Emergency Events Surveillance, 2004.

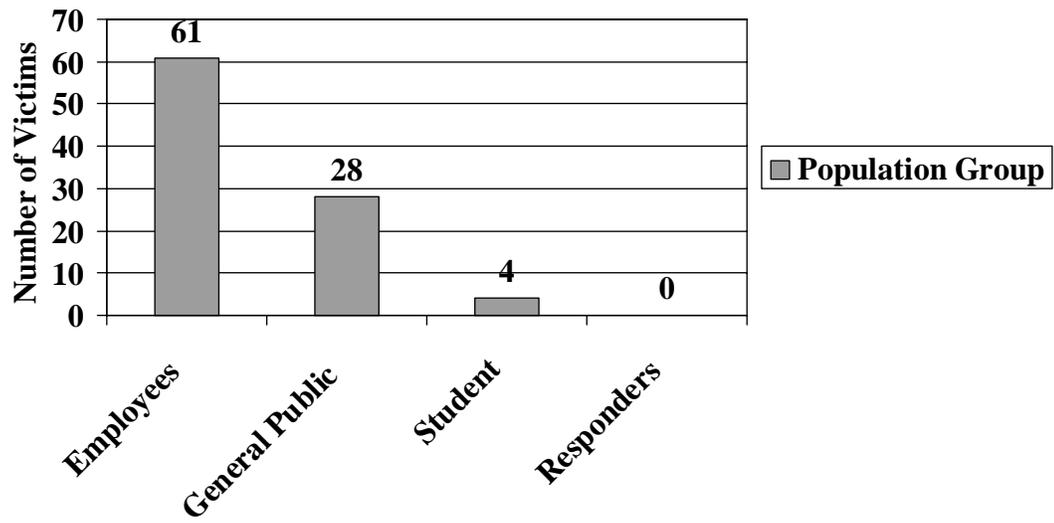


Table 6. –Frequency of substance categories in a all events and events with victims –Utah Hazardous Substances Emergency Events Surveillance System, 2004*

Substance category	All events		Events with victims		
	No.	%	No.	Percentage of all releases with victims	Percentage of events with victims in substance category
Acids	37	7.3	2	5.3	5.4
Ammonia	5	1.0	0	0.0	0.0
Bases	17	3.4	1	2.6	5.9
Chlorine	21	4.2	4	10.5	19.1
Formulations	0	0.0	0	0.0	0.0
Hetero-organics	5	1.0	0	0.0	0.0
Hydrocarbons	0	0.0	0	0.0	0.0
Mixture [†]	15	3.0	3	7.9	20.0
Multiple substance category	215	42.7	1	2.6	0.5
Other [‡]	30	6.0	1	2.6	3.3
Other inorganic substances [§]	64	12.7	6	15.8	9.4
Oxy-organics	28	5.6	14	36.8	50.0
Paints and dyes	8	1.6	0	0.0	0.0
Pesticides	12	2.4	3	7.9	25.0
Polychlorinated biphenyls	3	0.6	0	0.0	0.0
Polymers	9	1.8	1	2.6	11.1
Volatile organic compounds	35	6.9	2	5.3	5.7
Total[¶]	504	(100.2)	38	(99.9)	7.5

*Substances in events that involved multiple substances were counted only once in a substance category when all the substances were associated with the same category. If events involved multiple substances from different substance categories, they were counted only once in the multiple substance category.

[†]Substances from different categories that were mixed or formed from a reaction before the event.

[‡]Not classified.

[§]All inorganic substances except for acids, bases, ammonia, and chlorine.

[¶]Percentages do not total 100% because of rounding. Of a total of 504 events, 0 were excluded because they were not assigned a substance category.

Table 7. –Frequencies of injuries/symptoms, by type of event*-Utah Hazardous Substances Emergency Events Surveillance System, 2004

Injury/symptom	Fixed facility		Transportation		All events	
	No. injuries	%	No. injuries	%	Total no.	%
Chemical burns	0	0.0	0	0.0	0	0.0
Dizziness/central nervous system symptoms	30	20.4	2	33.3	32	20.9
Eye irritation	20	13.6	0	0.0	20	13.1
Gastrointestinal system problems	22	15.0	2	33.3	24	15.7
Headache	26	17.7	1	16.7	27	17.6
Heart problems	1	0.7	1	16.7	2	1.3
Heat stress	0	0.0	0	0.0	0	0.0
Other	0	0.0	0	0.0	0	0.0
Respiratory irritation	41	27.9	0	0.0	41	26.8
Shortness of breath	5	3.4	0	0.0	5	3.3
Skin irritation	2	1.4	0	0.0	2	1.3
Thermal burns	0	0.0	0	0.0	0	0.0
Trauma [†]	0	0.0	0	0.0	0	0.0
Total[‡]	147	(100.1)	6	(100.0)	153	(100.0)

*The number of injuries is greater than the number of victims (93) because a victim could have had more than one injury.

[†] There were no trauma related injuries.

[‡] Percentages do not total 100% because of rounding.

Figure 6. —Injury disposition, Utah Hazardous Substances Emergency Events Surveillance, 2004.

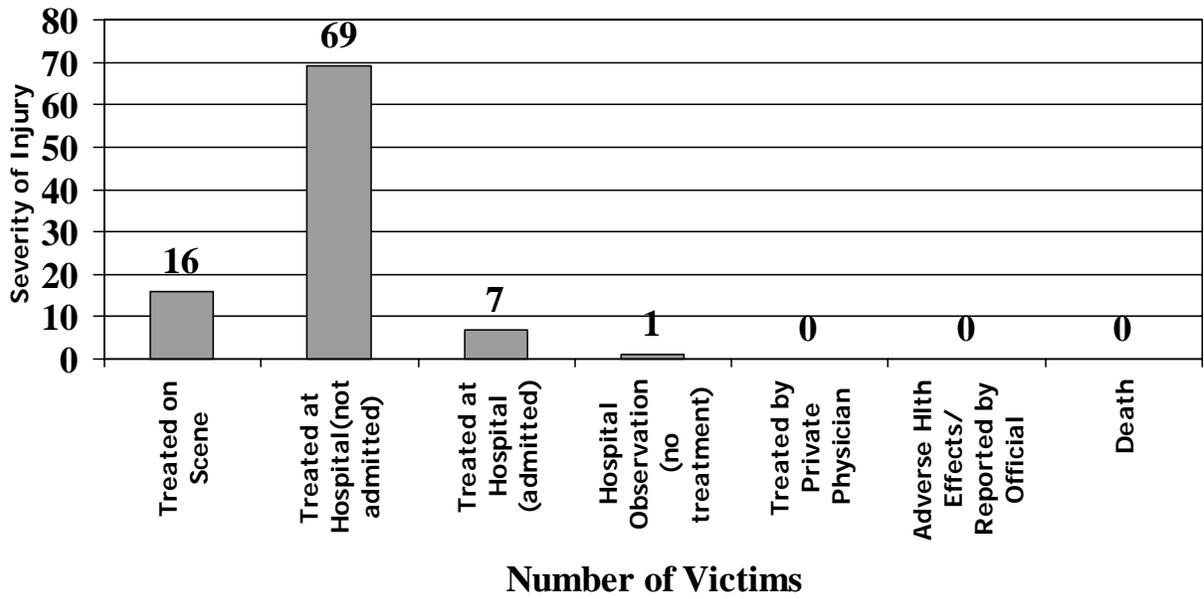


Table 8. –Distribution of personnel who responded to the event-Utah Hazardous Substances Emergency Events Surveillance System, 2004

Responder category	No.	%*
Certified HazMat team	35	7.9
Department of works/ utilities/ transportation	0	0.0
Emergency medical technicians	1	0.2
Environmental agency	3	0.7
EPA [†] response team	0	0.0
Fire department	25	5.6
Health department/health agency	7	1.6
Hospital personnel	1	0.2
Law enforcement agency	15	3.4
Other	6	1.4
Response team of company where release occurred	403	90.6
Specialized multi-agency team	0	0.0
State, county, or local emergency managers/coordinators/planning committees	0	0.0

*Percentages total greater than 100% because multiple responder categories could be reported per event.

[†]Environmental Protection Agency.

Table 9.— Cumulative data by year—Utah Hazardous Substances Emergency Events Surveillance, 2000-2004*

Year	Type of event			No. substances released	No. victims	No. deaths	Events with victims	
	Fixed facility	Transportation	Total				No.	% [†]
2000	140	163	303	375	46	0	11	3.6
2001	408	126	534	1104	94	0	13	2.4
2002	329	117	446	939	76	0	8	1.8
2003	364	110	474	1000	32	0	8	1.8
2004	397	107	504	1138	93	0	38	7.5
Total	1638	623	2261	4556	341	0	78	3.5

* Numbers in the table may differ from those reported in previous years because of adjustments in HSEES qualification requirements for events.

† Percentage of events with victims.